

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended) A pedicle screw assembly comprising:
 - a pedicle screw having a pair of spaced-apart threaded posts extending along a longitudinal axis thereof and defining a channel therebetween;
 - a ball collet comprising a generally spherical body having a ball collet bore formed therethrough, the ball collet being insertable along the longitudinal axis and into the channel;
 - a rod having first and second ends, the first end of the rod being insertable into said ball collet bore; and
 - a threaded cap configured and dimensioned to mate with the threaded posts, wherein the assembly is adjustable between a disassembled state in which the pedicle screw, ball collet, rod and cap are not secured to one another, and an assembled state in which:
 - the ball collet is seated in the channel;
 - the rod is gripped by an inner surface of the ball collet bore; and
 - the cap is screw-coupled to the post;
 - wherein said pedicle screw comprises ~~an integral~~ a threaded insertion portion and yoke portion, and said yoke portion comprises said threaded posts; ~~and~~
 - wherein said threaded posts are fixed relative to said threaded insertion portion in said disassembled state;
 - wherein the second end of the rod is provided with a partial hemispherical ball member having a convex surface facing an inboard side of the second end; and
 - wherein the second end of the rod is provided with a conical surface facing an outboard side of the second end.

2. (original) The assembly according to claim 1, wherein the threaded cap comprises:
a crown having a cylindrical skirt and a radially inwardly projecting flange; and
a clamping screw having a threaded portion configured and dimensioned to pass through
said flange.
3. (original) The assembly according to claim 2, wherein, when the assembly is in the
assembled state:
the cylindrical skirt encircles upper portions of the threaded posts; and
the radially inwardly projecting flange overlays axially directed end surfaces of the posts.
4. (original) The assembly according to claim 1, wherein the threaded cap has a concave
lower contacting surface with a spherical contour, the concave lower contacting surface abutting
the ball collet, when the assembly is in the assembled state.
5. (original) The assembly according to claim 1, wherein the pedicle screw is provided with
a concave seat having a spherical contour.
6. (original) The assembly according to claim 1, wherein the posts of the pedicle screw are
provided with threads on inner surfaces thereof.
7. (original) The assembly according to claim 1, wherein the ball collet is provided with a
plurality of slots spaced about a periphery thereof, each slot connecting an outer surface of the
ball collet with the ball collet bore.
8. (original) The assembly according to claim 6, wherein each slot extends in an axial
direction along a body axis of the ball collet.

9. (currently amended) A pedicle screw assembly comprising:
- a pedicle screw having a pair of spaced-apart threaded posts extending along a longitudinal axis thereof and defining a channel therebetween;
 - a ball collet comprising a generally spherical body having a ball collet bore formed therethrough, the ball collet being insertable along the longitudinal axis and into the channel;
 - a rod having first and second ends, the first end of the rod being insertable into said ball collet bore; and
 - a threaded cap configured and dimensioned to mate with the threaded posts, wherein the assembly is adjustable between a disassembled state in which the pedicle screw, ball collet, rod and cap are not secured to one another, and an assembled state in which: the ball collet is seated in the channel;
 - the rod is gripped by an inner surface of the ball collet bore; and
 - the cap is screw-coupled to the post;
 - wherein the posts of the pedicle screw are provided with threads on inner surfaces thereof;
 - wherein each slot communicates with a single end of the ball collet bore and alternating slots communicate with opposite ends of the ball collet bore; ~~and~~
 - wherein said pedicle screw comprises ~~an integral~~ a threaded insertion portion and yoke portion, and said yoke portion comprises said threaded posts; ~~and~~
 - wherein said threaded posts are fixed relative to said threaded insertion portion in said disassembled state;
 - wherein the second end of the rod is provided with a partial hemispherical ball member having a convex surface facing an inboard side of the second end; and
 - wherein the second end of the rod is provided with a conical surface facing an outboard side of the second end.

10. (original) The assembly according to claim 1, wherein the second end of the rod is provided with a spherical ball member.

11. (original) The assembly according to claim 10, wherein a diameter of the spherical ball member is similar to a diameter of the ball collet.
12. (canceled)
13. (currently amended) The assembly according to claim [[12]]1, wherein the convex surface of the partial hemispherical ball member follows a spherical contour belonging to a sphere having a diameter similar to a diameter of the ball collet.
14. (canceled)
15. (currently amended) The assembly according to claim [[12]]1, wherein the partial hemispherical ball member has a centrally located protrusion having a spherical portion facing an outboard side of the second end and the conical surface tapers to a shaft of the centrally located protrusion.
16. (previously presented) The assembly according to claim [[12]]1, wherein the partial hemispherical ball member has a centrally located recess to accept a spherical portion facing an outboard side of the second end and the conical surface tapers to a rim of the centrally located recess.
17. (currently amended) A pedicle screw assembly comprising:
first and second pedicle screws, each pedicle screw having a longitudinal axis and a pair of spaced-apart threaded posts extending therealong, each pair of threaded posts defining a channel therebetween;
a ball collet comprising a generally spherical body having a ball collet bore formed therethrough, the ball collet being insertable into the channel of the first pedicle screw along the first pedicle screw's longitudinal axis;

a rod having a first end and a bulbous second end, the first end of the rod being insertable into said ball collet bore, and the bulbous second end being insertable into the channel of the second pedicle screw along the second pedicle screw's longitudinal axis; and

first and second threaded caps configured and dimensioned to mate with the threaded posts of respective first and second pedicle screws,

wherein the assembly is adjustable between a disassembled state in which the first and second pedicle screws, ball collet, rod and caps not secured to one another, and an assembled state in which:

the ball collet is seated in the channel of the first pedicle screw;

the rod is gripped by an inner surface of the ball collet bore;

the bulbous second end of the rod occupies the channel of the second pedicle screw; and

the first and second caps are screw-coupled to the threaded posts of respective first and second pedicle screws;

wherein each pedicle screw comprises an integral threaded insertion portion and yoke portion, and said yoke portion comprises said threaded posts; ~~and~~

wherein said threaded posts are fixed relative to said threaded insertion portion in said disassembled state;

wherein the second end of the rod is provided with a partial hemispherical ball member having a convex surface facing an inboard side of the second end; and

wherein the second end of the rod is provided with a conical surface facing an outboard side of the second end.

18. (currently amended) The pedicle screw assembly according to claim ~~[[16]]17~~, wherein the bulbous second end comprises a spherical ball member.

19. (original) The pedicle screw assembly according to claim 17, wherein a diameter of the spherical ball member is similar to a diameter of the ball collet.

20. (currently amended) A pedicle screw assembly comprising:

first, second and third pedicle screws, each pedicle screw having a longitudinal axis and a pair of spaced-apart threaded posts extending therealong, each pair of threaded posts defining a channel therebetween;

first and second ball collets, each comprising a generally spherical body having a ball collet bore formed therethrough, the ball collets being insertable into the channels of respective first and second pedicle screws along corresponding longitudinal axes;

a first rod having a first end insertable into the ball collet bore of the first ball collet, and a first rod second end provided with a first partial hemispherical ball member, the first partial hemispherical ball member having a convex surface facing an inboard side of the first rod second end, and a centrally located protrusion facing an outboard side of the first rod second end;

a second rod having a first end insertable into the ball collet bore of the second ball collet, and a second rod second end provided with a second partial hemispherical ball member, the second partial hemispherical ball member having a convex surface facing an inboard side of the second rod second end, and a centrally located recess facing an outboard side of the second rod second end; and

first, second and third threaded caps configured and dimensioned to mate with the threaded posts of respective first, second and third pedicle screws,

wherein the assembly is adjustable between a disassembled state in which the pedicle screws, ball collets, rods and caps are not secured to one another, and an assembled state in which:

the first and second ball collets occupy channels of the first and second pedicle screws, respectively;

the first rod is gripped by an inner surface of the first ball collet bore and the second rod is gripped by an inner surface of the second ball collet bore;

the first and second partial hemispherical ball members oppose one another within the channel of the third pedicle screw, with the protrusion at least partially entering the recess; and the three caps are screw-coupled to the pairs of threaded posts of three pedicle screws;

wherein each pedicle screw comprises an integral threaded insertion portion and yoke portion, and said yoke portion comprises said threaded posts; and

wherein said threaded posts are fixed relative to said threaded insertion portion in said disassembled state; and

wherein when the centrally located protrusion has at least partially entered the recess, a joint is established in which a range of motion between the first rod and second rod is achieved without rotation of either rod about a rod axis.

21. (original) The pedicle screw assembly according to claim 20, wherein the convex surfaces of the first and second partial hemispherical ball members opposing one another within the channel of the third pedicle screw together follow a spherical contour belonging to a sphere having a diameter similar to a diameter of either ball collet.

22. (original) The pedicle screw assembly according to claim 20, wherein:

the first rod second end is provided with a first conical surface facing an outboard side thereof; and

the second rod second end is provided with a second conical surface facing an outboard side thereof.

23. (canceled)

24. (canceled)

25. (currently amended) A pedicle screw assembly comprising:

a pedicle screw having a pair of spaced-apart threaded posts extending along a longitudinal axis thereof and defining a channel therebetween;

a first rod having a first rod end provided with a first partial hemispherical ball member, the first partial hemispherical ball member having a convex surface facing an inboard side of the first rod end, and a centrally located protrusion facing an outboard side of said first rod end; and

a second rod having second rod end provided with a second partial hemispherical ball member, the second partial hemispherical ball member having a convex surface facing an

inboard side of the second rod end, and a centrally located recess facing an outboard side of the second rod end; and

a threaded cap configured and dimensioned to mate with the pair of spaced-apart threaded posts,

wherein the assembly is adjustable between a disassembled state in which the pedicle screw, first and second rods and cap are not secured to one another, and an assembled state in which:

the first and second partial hemispherical ball members oppose one another within the channel of the pedicle screw, with the protrusion at least partially entering the recess; and

the cap screw-coupled to the pair of threaded posts;

wherein said pedicle screw comprises an integral threaded insertion portion and yoke portion, and said yoke portion comprises said threaded posts; and

wherein said threaded posts are fixed relative to said threaded insertion portion in said disassembled state; and

wherein:

the first rod end is provided with a first conical surface facing the outboard side of the first rod end and the first conical surface tapers to the centrally located protrusion; and

the second rod end is provided with a second conical surface facing the outboard side of the first rod end and the second conical surface tapers to the centrally located recess.

26. (canceled)

27. (canceled)

28. (canceled)

29. (currently amended) A one-piece pedicle screw formed from titanium or an alloy thereof in combination with a ball collet, the one-piece pedicle screw comprising a threaded insertion portion aligned with said longitudinal axis, a top of the threaded insertion portion connected to a yoke portion comprising a pair of spaced apart posts, said posts having arcuate cross-sections and

defining a substantially cylindrical channel, end portions of the posts having radially inwardly facing threads, a base of the channel being provided with a concave seat having a spherical contour;

wherein the ball collet comprises a generally spherical body having an outer diameter of about 0.375 inches and formed from titanium or an alloy thereof, the body having a ball collet bore formed therethrough along a body axis, the body being provided with a plurality of slots spaced about a periphery thereof, each slot extending in an axial direction along the body axis and connecting an outer surface of the ball collet with the ball collet bore, each slot communicating with a single end of the ball collet bore and alternating slots communicating with opposite ends of the ball collet bore;

wherein said pedicle screw comprises ~~an integral~~ a threaded insertion portion and yoke portion, and said yoke portion comprises said threaded posts; and

wherein said threaded posts are fixed relative to said threaded insertion portion when said screw is in a disassembled state.

30. (canceled)

31. (canceled)

32. (canceled)

33. (canceled)

34. (new) The assembly according to claim 1, wherein a ratio of a bore diameter of the ball collet to an outer diameter of the ball collet is about 0.6.

35. (new) The assembly according to claim 34, wherein the bore diameter of the ball collet is about 0.2165 inches.

36. (new) The assembly according to claim 34, wherein the spherical body of the ball collet has the outer diameter of about 0.375 inches.
37. (new) The assembly according to claim 9, wherein the spherical body of the ball collet has an outer diameter of about 0.375 inches.
38. (new) The assembly according to claim 38, wherein a bore diameter of the ball collet is about 0.2165 inches.
39. (new) The pedicle screw assembly according to claim 20, wherein the threaded insertion portion and yolk of the pedicle screw is an integral threaded insertion portion and yolk.
40. (new) The pedicle screw assembly according to claim 22, wherein the first conical surface and the second conical surface are cut back from the vertical plane by an angle that is preferably in a range of 10 to 20 degrees.
41. (new)) The pedicle screw assembly according to claim 22, wherein when the centrally located protrusion has at least partially entered the recess, the first rod can accommodate turns of up to about 40 degrees from collinear with respect to the second rod.
42. (new) The pedicle screw assembly according to claim 23, wherein the spherical body of the ball collet has an outer diameter of about 0.375 inches.
43. (new) The pedicle screw assembly according to claim 25, wherein the first conical surface and the second conical surface are cut back from the vertical plane by an angle that ranges from 10 to 20 degrees and when the centrally located protrusion has at least partially entered the recess, a joint is established in which an entire range of motion between the first rod and second rod may be achieved without rotation of either rod.

44. (new) The pedicle screw assembly according to claim 43, wherein when the centrally located protrusion has at least partially entered the recess, the first rod can accommodate turns of up to about 40 degrees from collinear with respect to the second rod.